Bailey

DOCKETED

AUG 22 1979

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

BALLY MANUFACTURING CORPORATION,	)	
	)	
Plaintiff,	)	
	)	CIVIL ACTION NO.
v.	)	
	)	78 C 2246
D. GOTTLIEB & CO., a corporation,	)	
WILLIAMS ELECTRONICS, INC., a	)	
corporation, and	)	
ROCKWELL INTERNATIONAL CORPORATION,	)	
a corporation,	)	
	)	
Defendants.	)	

AFFIDAVIT OF ROBERT BROWNING IN SUPPORT OF ROCKWELL'S MOTION TO DISMISS UNDER RULE 12, FED. R. DIV. P.

Robert Browning, being duly sworn, deposes and says that:

(1) He has been an employee of Rockwell International Corporation (hereafter Rockwell) since 1962.

(2) In 1978 he was Manager of Subsystem Marketing at Rockwell and had marketing responsibility for a microcomputer controller (hereafter the Gottlieb Controller) manufactured and sold by Rockwell to D. Gottlieb and Co. (hereafter Gottlieb) for use in controlling operation of Gottlieb pinball machines.

(3) As Manager of Subsystem Marketing he also had marketing responsibilities in 1978 for a Rockwell general purpose industrial controller designated the Rockwell STC Controller Module.

(4) Because the Rockwell STC Controller Module was to be a differently programmed Gottlieb Controller, Rockwell sought permission from Gottlieb to use the Gottlieb Controller as the STC Controller Module. To this end, he drafted a letter to be sent to Gottlieb under the signature of R. E. McHenry of Rockwell. This letter was sent to Gottlieb on or about March 8, 1978 and is attached hereto as Exhibit A. Exhibit A shows paragraph 5 having the particular royalty rate expunged.

(5) He read and approved a follow-up letter to be sent to Gottlieb under the signature of C. D. Bopf of Rockwell. This letter was sent on or about April 10, 1978, and is attached hereto as Exhibit B.

(6) Gottlieb responded to the Rockwell requests by a letter dated April 17, 1978 which gave permission for Rockwell to use the Gottlieb Controller as the STC Controller Module. A copy of this letter is attached hereto as Exhibit C.

(7) Rockwell presented information on the STC Controller Module at several trade shows in 1978. He helped prepare a set of documents, attached hereto as Exhibit D, describing the STC Controller Module and which were for use at the trade shows.

(8) In the June 8, 1978 issue of Machine Design magazine, an article was published describing the Rockwell STC Controller Module. A copy of this article is attached hereto as Exhibit E.

(9) In response to the aforementioned promotional activities, Rockwell received many inquiries from interested potential users

for the Rockwell STC Controller Module.

(10) Rockwell responded to one of the earlier inquiries for the STC Controller Module with a proposed system, including software. The inquiry and Rockwell's response are attached as Exhibits F1, F2.

(11) One of the more recent inquiries as to the STC Controller Module was dated May 30, 1979, and inquired as to its applicability for controlling commercial dishwashers. This inquiry is attached hereto as Exhibit G.

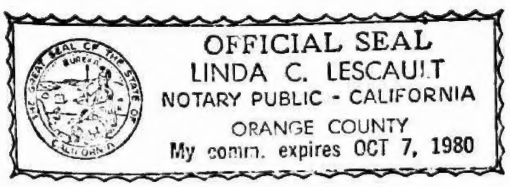
Further affiant sayeth not.

Robert Browning

SUBSCRIBED AND SWORN TO before me this 14th day of August, 1979.

Linda C. Lescault
Notary Public in and for
Orange County, California

[SEAL]



Electronic Devices Division
3310 Miraloma Avenue
P.O. Box 3669
Anaheim, CA U.S.A. 92803

Rockwell International

March 8, 1978

D. Gottlieb & Company
165 West Lake Street
Northlake, Illinois 60164

Attention: Mr. Judd Weinberg

Dear Judd:

Pursuant to your discussion with Bob Browning of January 10th and your meeting with Chuck Bopf on March 7th, Rockwell requests your approval for independant Rockwell sales of a reprogrammed version of Gottlieb module Part No. PB000-D100.

The reason for the request is to allow Rockwell to utilize your pinball controller module as a controller module for industrial control applications. The initial application is proposed for use by a laundry equipment manufacturer as a controller for three separate and different laundry folding machines.

We would completely reprogram the system to act as a general purpose industrial controller, and then provide ancillary interface and a display module to meet the specific requirements of each program. In addition, for each specific job a PROM reprogramming is assumed to provide the means of customizing the controller for the required performance.

Regarding the potential volume usage of this module, I can only indicate that the first program we are evaluating represents about 500 to 1,000 systems per year, but additional applications will certainly be available and could lead to an estimated market of about 10,000 units per year.

Naturally, any deliveries would be on a non-interferance basis with the Gottlieb contract as it may be ammended. If any additional capital expenditures are necessary to meet these added requirements, it would be at Rockwell expense. We propose to pay a royalty to Gottlieb in the amount of [redacted] of the selling price of the unit and, of course, such sales would be auditable by independant auditors. Present estimate of the market value of the product would be approximately $250.00 to $300.00 per circuit board; of course, depending upon volume and duration of the program.

The Design Engineers' Show in mid-April '78 in Chicago is an ideal place to begin our marketing activity for the product. A favorable response from you prior to April 1st would allow us to proceed with our plans in support of that show.

Yours truly,

R. E. Mc Henry
Business Director
Subsystems Products

Electronic Devices Division
3310 Miraloma Avenue
P.O. Box 3669
Anaheim, CA U.S.A. 92803

Rockwell International

April 10, 1978

D. Gottlieb & Co.
165 West Lake Street
Northlake, Illinois 60164

Attention: Mr. Judd Weinberg

Dear Judd:

In our letter of March 8, we outlined a proposed program whereby Rockwell would reconfigure the basic Gottlieb controller board for sale as a standard industrial controller. I understand in conversation with R. E. McHenry and M. B. Northrup last week your response to our proposal is favorable.

To initiate marketing activity, we would like to introduce this product at the Design Engineer Show beginning April 17 in Chicago. I will be working with Bob Bloom this week on the necessary details to finalize the arrangements with respect to the specific product, its intended application and the royalty payment provisions. Meanwhile, we have prepared the attached brochure which, subject to your approval, we would like to use at the show beginning next week to promote this product. I will be in touch with you on this subject later this week.

Best regards,

ROCKWELL INTERNATIONAL CORPORATION
Microelectronic Devices

C. D. Bopf
Manager

/cmm

Attachment

D. Gottlieb & Co.
A Columbia Pictures Industries Company
165 W. Lake Street • Northlake, Illinois 60161 • Phone: 312 562-7400 • Telex: 72-6163

April 17, 1978

Mr. C. D. Bopf, Manager
Rockwell International
Electronic Devices Division
P.O. Box 3669
Anaheim, CA 92803

Dear Chuck,

This letter will confirm my phone message left last Friday advising that D. Gottlieb & Company sees no reason why Rockwell cannot distribute publicly the Rockwell brochure covering the STC Universal Controller Module in the format sent to us and covered by your letter of April 10, 1978.

We appreciate the courtesy extended by you giving us the opportunity to review this and all future Rockwell published matter concerning directly or indirectly our pinball control system and/or any component thereof. We will continue to respond to your inquiries on as timely a basis as possible.

Sincerely,

D. GOTTLIEB & COMPANY

Robert W. Bloom
Vice President - Finance

RWB:dmm
cc: J. Weinberg
R. McHenry

Rockwell International

A NEW APPROACH FOR INDUSTRIAL CONTROLLERS

S/S 805 ghS

GORDON H. SMITH

CHARACTERISTICS OF INDUSTRIAL CONTROLLERS

- LOW TO MODERATE QUANTITIES
- GENERALLY CONTROL ELECTROMECHANICAL DEVICES
- FLEXIBILITY REQUIRED
- MICROCOMPUTERS USED ONLY IN COST EFFECTIVE APPLICATIONS

GOALS OF NEW APPROACH

- ENHANCE APPLICATIONS FOR LOW QUANTITIES
- REDUCE SOFTWARE COST
- LOW COST HARDWARE
- EASY INTEGRATION
- QUICK DESIGN TURN AROUND

CLASSICAL APPROACH TO INDUSTRIAL APPLICATION OF MICROCOMPUTERS

- EXAMINE PROBLEM
- PICK MICROCOMPUTER FAMILY
- SELECT SINGLE BOARD COMPUTER OR SELECT DEVICES DESIGN AND FAB BOARD
- GENERATE SOFTWARE (FIRMWARE)
- INTEGRATE WITH SYSTEM

SOFTWARE APPROACHES

- MACHINE LANGUAGE PROGRAMMING
  - DEVELOPMENT HARDWARE INEXPENSIVE
  - TIME CONSUMING
- ASSEMBLY LEVEL PROGRAMMING
  - DEVELOPMENT HARDWARE MORE EXPENSIVE
  - LESS TIME
- INTERPRETERS
  - SOFTWARE EXPENSIVE FOR INTERPRETER
  - TAILORED TO SPECIFIC REQUIREMENTS
  - UNDERSTANDABLE
- COMPILERS
  - GENERALLY CROSS COMPILED
  - LESS CONTROL

NEW APPROACH - ROCKWELL STC CONTROLLER

SEQUENCING TIMING COUNTING CONTROLLER

- BEST OF HARDWARE/SOFTWARE APPROACHES
- HARDWARE: SINGLE BOARD COMPUTER

  PROGRAM: COMPILER GENERATES INTERPRETER INSTRUCTIONS

  INTERPRETER DECODED AND EXECUTED BY

  SELF CONTAINED PROGRAM IN
  SINGLE BOARD COMPUTER

STC HARDWARE CAPABILITIES

- FLEXIBLE INPUT/OUTPUT
  - 50 INPUTS ____ SINGLE LINE OR GROUPED INTO 4 BIT DIGITS
  - 60 OUTPUTS ____ SINGLE LINE OR GROUPED INTO 4 BIT DIGITS
  - 4 TIMERS
- FLEXIBLE REGISTER STORAGE
  - 16 BIT or 4 DIGIT COUNTER/STORAGE ELEMENTS - 32 SETS
  - SETS MAY BE OPERATED INDIVIDUALLY (MAX VALUE = 9,999)
  - SETS MAY BE COUPLED (MAX VALUE 99,999,999)
- FLEXIBLE CAPABILITIES
  - ON BOARD CMOS + BATTERY KEEPS REGISTERS WHEN POWER OFF
  - TIME OF DAY CLOCK OPTION

INPUT/OUTPUT ASSIGNMENT

Input Signal Function		Input Signal Assignment
START (START PUSH BUTTON)	=	BIS1
PRESOAK (PRESOAK SWITCH)	=	BIS2
FULL (FULL SWITCH)	=	BIS8
EMPTY (EMPTY SWITCH)	=	BIS9

Output Signal Function		Output Signal Assignment
AGITATOR (AGITATOR CLUTCH SOLENOID)	=	BOD1
DETERGENT (DETERGENT VALUE SOLENOID)	=	BOD5
COLD (COLD WATER VALUE SOLENOID)	=	BOD6
PUMP (DRAIN WATER PUMP)	=	BOS14
MOTOR (SPIN MOTOR)	=	BOS15

Other Assignments		Internal Flags
RINSE 1 (FIRST RINSE STATUS)	=	FLAG 3

STATEMENT OF PROBLEM

BEGIN: WAIT UNTIL START IS ON; GO TO FILL AND RETURN - IF PRESOAK IS ON - WAIT 5 MINUTES. TURN AGITATOR ON. TURN DETERGENT ON, WAIT 5 SECONDS, TURN DETERGENT OFF. WAIT 12 MINUTES, TURN AGITATOR OFF. GO TO DRAIN AND RETURN.

GO TO SPIN AND RETURN. TURN RINSE1 OFF

RINSE: TOGGLE RINSE 1. GO TO FILL AND RETURN. TURN AGITATOR ON, WAIT 1 MINUTE, TURN AGITATOR OFF. GO TO DRAIN AND RETURN. GO TO SPIN AND RETURN. IF RINSE1 IS ON, GO TO RINSE. GO TO BEGIN

STATEMENT OF PROBLEM (Cont)

FILL: TURN HOT ON, TURN COLD ON, WAIT UNTIL FULL IS ON. TURN HOT OFF; TURN COLD OFF; RETURN

DRAIN: TURN PUMP ON, WAIT UNTIL EMPTY IS ON. TURN PUMP OFF. RETURN

SPIN: TURN MOTOR ON, WAIT 30 SECONDS. REPEAT NEXT 4 STEPS 3 TIMES: (1) TURN HOT ON, (2) WAIT 8.5 SECONDS, (3) TURN HOT OFF, (4) WAIT 20 SECONDS. WAIT 2.8 MINUTES; TURN MOTOR OFF. RETURN

SAMPLE PROGRAM

YOU HAVE ALREADY SEEN IT .....

DESIGN FLOW USING STC CONTROLLER

- DEFINE SIGNALS AND FUNCTIONS
- KEY INTO PROM COMPILER
- PLUG PROMS INTO STC CONTROLLER

STC CONTROLLER COMMANDS

COMMAND	FUNCTION
If (f) ON If (f) OFF	f = STATUS INDICATOR, INTERNAL INDICATOR, DISCRETE INPUT, DISCRETE OUTPUT

If (f1) EQUAL (f2)
If (f1) GREATER THAN (f2)
If (f1) LESS THAN (F2)
	f1, f2, = TIMERS, DISPLAYS, COUNTERS, DIGITAL INPUTS, TIME-OF-DAY CLOCK, CONSTANTS

GO TO (function) AND STAY GO TO (function) AND SET TO RETURN	FUNCTION = NAME OF ANY COMMAND IN PROGRAM
RETURN	RETURNS TO NEXT INSTRUCTION AFTER ONE WHICH SET TO RETURN

STC CONTROLLER COMMANDS (Cont)

COMMAND	FUNCTION
Turn (f) ON Turn (f) OFF	f = STATUS INDICATOR, INTERNAL INDICATOR, DISCRETE OUTPUT
SET (f1) EQUAL TO (f2)	f1 - DISPLAY, TIMER, COUNTER, DIGITAL OUTPUT, DIGITAL INPUT, TIME-OF-DAY CLOCK, CONSTANT
TOGGLE (f) (If ON, TURN OFF, If OFF, TURN ON)	f = STATUS INDICATOR, INTERNAL INDICATOR, DISCRETE OUTPUT

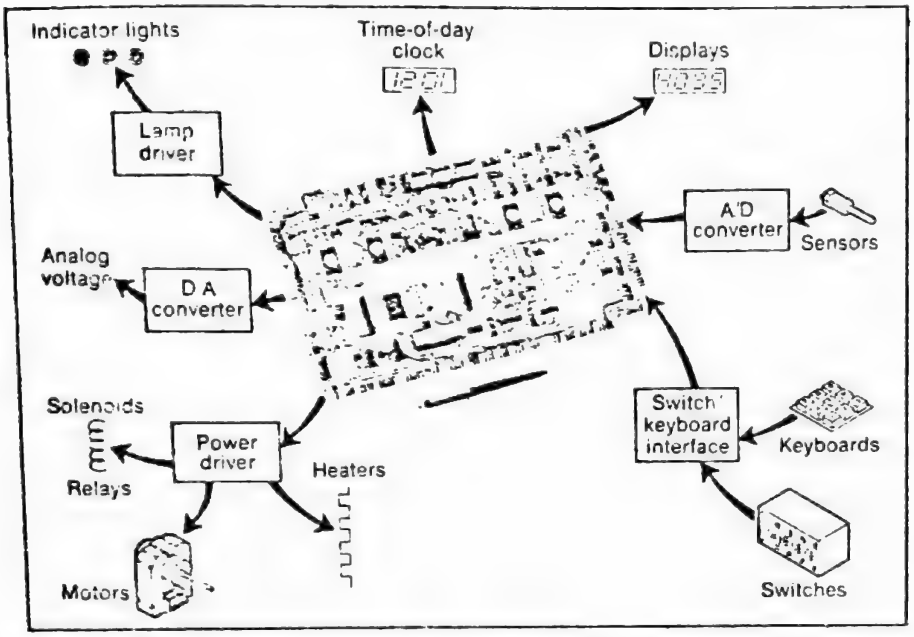
STC CONTROLLER COMMANDS (Cont)

COMMAND	FUNCTION
ADD (f2) to (f1) SUBTRACT (f2) from (f1)	f1 = DISPLAY, TIMER, COUNTER, DIGITAL OUTPUT f2 = DISPLAY, COUNTER, TIMER, DIGITAL OUTPUT, DIGITAL INPUT, CONSTANT
MULTIPLY (c) by (n)	C = COUNTER n = XX.XX
REPEAT (n1) COMMANDS (n2) TIMES	n1 = NUMBER OF COMMANDS n2 = NUMBER OF TIMES

STC CONTROLLER COMMANDS (Cont)

COMMAND	FUNCTION
WAIT (s) SECONDS	S = 0.1 to 3600 SECONDS
WAIT (m) MINUTES	m = 1 to 128 MINUTES
WAIT (h) HOURS	h = 1 to 128 HOURS
WAIT UNTIL (f) is ON WAIT UNTIL (f) is OFF	f = TIMER, DISCRETE INPUT
CONVERT (f1) to (f2) FROM (table)	f1 = PLAY, COUNTER, DIGITAL OUTPUT f2 = COUNTER, DIGITAL INPUT TABLE = NAME OF CONVERSION TABLE

Product Controller Is Programmed in English



English-programmable module is designed to replace electromechanical components in a variety of control applications where sequencing, timing, and counting functions are required. The module is described as being economic to customize for one or 1,000 machines.

A new microprocessor-based controller module can be programmed in plain English. Developed by Rockwell International, the module offers an easy and low-cost way to computerize a wide variety of products.

Called the STC universal controller module, the device provides sequencing, timing, and counting (hence STC) functions on a predesigned, pretooled printed-circuit board. In many applications, it is expected to keep product design and production costs low and to be cost effective in quantities from one to 1,000.

Programming is by means of English language commands that enable the design engineer to write the control program for his own product, even if he knows nothing about computers. Module

Example: Programming Commands To a Washing Machine

INPUT/OUTPUT ASSIGNMENTS: Start (pushbutton), presoak (switch), agitator (clutch solenoid), detergent (valve solenoid), rinse-1 (status flag), hot (water-valve solenoid), cold (water-valve solenoid), full (indicator), empty (indicator), pump (drain water pump), and motor (spin motor).

PROGRAM LISTING:

```
Begin
Wait until start is on
Go to fill & return
If presoak is on wait 5 min
Turn agitator on
Turn detergent on
Wait 5 sec
Turn detergent off
Wait 12 min
Turn agitator off
Go to drain & return
Go to spin & return
Turn rinse-1 off
Rinse
Toggle rinse-1
Go to fill & return
Turn agitator on
Wait 1 min
Turn agitator off
Go to drain & return
Go to spin & return
If rinse-1 is on go to rinse
Go to begin

FILL
Turn hot on
Turn cold on
Wait until full is on
Turn hot off
Turn cold off
Return

DRAIN
Turn pump on
Wait until empty is on
Turn pump off
Return

SPIN
Turn motor on
Wait 30 sec
Repeat next 4 commands 3 times
Turn hot on
Wait 8.5 sec
Turn hot off
Wait 20 sec
Wait 2.8 min
Turn motor off
Return
```

hardware is not physically changed for different types of jobs, although the designer may need special interface circuits that translate signals from his system's components—displays, switches, sensors, motors, and the like—into a form recognizable by the module.

For input and output interface design, Rockwell offers help. Write to Subsystem Applications Engineering, D/833-051 RC33, Rockwell International Microelectronic Devices, P.O. Box 3669, Anaheim, Calif. 92803. MD

The Functional Features

The STC universal controller accepts 13 command types. Other functional features include:

- 32 four-digit counters can independently count to 9,999 or can be coupled to count to 99,999,999.
- 50 inputs and 60 outputs.
- Digital inputs and outputs can be binary or decimal.
- 4 timers provide timing down to 0.1-sec intervals.
- 32 digits of display.
- On-board battery backup retains the setting of all counters when power is off.
- Time-of-day clock allows processes to be monitored and sequenced at specific times.

The 13 Types of Command

Command	Function(s)	Description
If (f) on If (f) off	(f) = indicator, discrete input or output, etc.	Causes the next command to be performed only if the specified condition is met

If (f1) = (f2)
If (f1) > (f2)
If (f1) < (f2)
	(f1), (f2) = timers, displays, counters, inputs, outputs, etc.	Similar to the above IF commands, but operation is conditional

Go to (label) and stay Go to (label) and set to return	(label) = label of any command in program	Next and subsequent commands will be found at the location identified by the specified (label)
Return		Next and subsequent commands will be found immediately following the last Go to (label) and set to return command given
Turn (f) on Turn (f) off	(f) = indicator, discrete output	Causes the specified function to be turned on or off
Set (f1) equal to (f2)		Causes function one to be set equal to function two
Toggle (f)		Turns (f) off if it is on and vice versa
Add (f2) to (f1) Subtract (f2) from (f1)	Both are displays, timers, counters, etc.	Adds or subtracts the two
Multiply (c) by (n) Divide (c) by (n)	(c) = counter; (n) = 2, 4, 8, or 16	
Repeat (n1) commands (n2) times	(n1) = number of commands, (n2) = number of repetitions	
Wait (s) seconds, or (m) minutes or (h) hours		Delays the next command
Wait until (f) is on Wait until (f) is off		Delays the next command until the function has turned on or off
Convert (f1) to (f2) from (table)		Converts function one to function two based on a user-specified conversion (table)

Hydraulic Fluids Double as Cutting Fluid

Until recently, there has been no completely effective way to keep hydraulic fluid from contaminating the cutting fluid in machine tools. A new fluid developed by E.F. Houghton & Co. may solve the problem by eliminating the need for fluid segregation. Hydra-Cut 496 can be used in both the hydraulic circuit and the cutting-coolant circuit of most machine tools.

Depending on the type of hydraulic system used, the new fluid can be used as hydraulic fluid neat, or mixed with water. Diluted with water to 3 to 5% concentration, it can also be used as a cutting coolant. Small amounts of fluid leaking from one system to the other do not require draining, cleaning, and refilling; they merely change fluid concentration a bit.

Hydra-Cut 496 is compatible with most of the elastomers commonly employed in hydraulic systems. However, it has a pH of 10.2 as supplied, and 9.2 in 5% solution, so leather seals should be replaced with a compatible elastomer before converting to the new fluid.

The fluid is inhibited to protect against corrosion for both metal-cutting and hydraulic applications. It provides good anti-wear characteristics for hydraulic systems, and has the film strength and frictional properties needed for metal cutting. None of the fluid components are hazardous by NIOSH definition. MD

THOMAS ENGINEERING INC.

Central and Ela Roads, P.O. Box 198 · Hoffman Estates, Illinois 60195

Area Code 312 / 358-5800
Telex #28-1054

May 3, 1978

Subsystems Applications Engineering
D/833-051 RC 33
Rockwell International Microelectronics Devices
P. O. Box 3669
Anaheim, CA. 92803

Dear Sirs,

We are interested in adapting your STC Universal Controller Module as displayed at the recent Design Engineering Show in Chicago to some of our line of pharmaceutical process equipment. Of immediate interest is the Accela Cota which is used to coat tablets with either sugar or film coating.

The basic process is one of spraying for a short period of time, drying for a period of time, repeating this cycle with possibly different times and coatings as the coating thickness builds on the tablets and signalling when all is done. The entire elapsed time can be as great as 24 hours but with time accuracies of one (1) second or better. In addition, overriding controls from inlet air temperature, exhaust air temperature and humidity as well as manual override are desired. Also, since the "recipe" followed varies with type of tablet and coating, a means of this change must be provided for operating personnel.

Your unit seems to be well adapted for this usage with its time and counting capability as well as the capability to stop and hold the time/count if there is any interruption.

The following is a list of the input, output, displays and control functions that are desired:

A. Inputs - Analog signals applied through A/D converters that if not proper will suspend program but <u>not</u> <u>reset</u> it to start.

1. Inlet air temperature (must be above ____° C).
2. Exhaust air temperature (must be below ____° C).
3. Exhaust relative humidity (must be below ____%).

B. Outputs (independently controlled)

1. Spray from nozzle A, B, or C or any combination.
2. Not spray.
3. Coating pan rotating.
4. Coating pan not rotating.
5. Alarm if any input condition is out of limits.

C. Displays

1. Some form of display easily recognizable by operating personnel that show them they have put in the program correctly.
2. Same display can be used to tell operating personnel where the coating cycle is during the actual cycle.

D. Basic program (see next page)

The above information is necessarily vague due to the large number of recipes used in the pharmaceutical industry and our desire to furnish as "universal" a control as possible. What we are primarily interested in at this time are answers to the following list of questions:

1. Is your STC module truly applicable to this application?

2. On a low volume basis (10 or less a year), what would be the cost of the module assuming we would provide the necessary input and output interfaces?

3. What would be the cost and type of operator controlled input device to insert the required recipe (program) information?

4. What type of display do you feel would be most "legible" to relatively unskilled (not even English speaking) operating personnel?

Very truly yours,

THOMAS ENGINEERING INC.

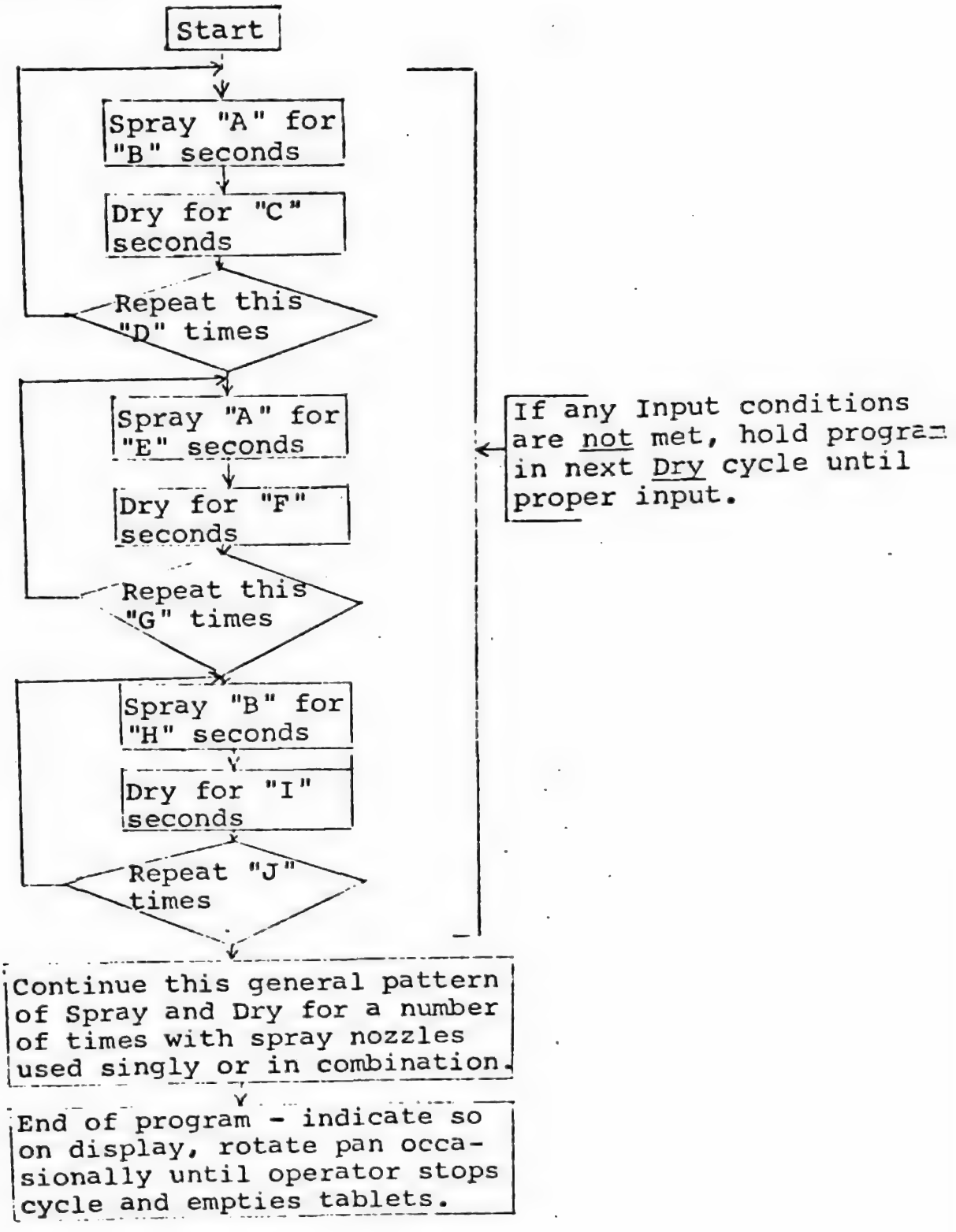
E. H. Beneke

E. H. Beneke
Electronic Engineer

EHB/sm

CC: D. R. Meyer, Chief Engineer
Rockwell Microelectronics, DesPlaines, Il.

D. Basic program



Electronic Devices Division
3310 Miraloma Avenue
P.O. Box 3669
Anaheim, CA U.S.A. 92803

Rockwell
International

May 12, 1978

Thomas Engineering Incorporated
Central and Ela Roads
P.O. Box 198
Hoffman Estates, Illinois 60195

Attention: Mr. E. H. Beneke

Reference: Your letter of May 3, 1978

Dear Mr. Beneke:

Thank you for the referenced letter of May 3rd and for your expressed interest in our STC modules.

Attached you will find a brief engineering evaluation of your problem and, as you can see, the proposed solution is fairly straight forward. The STC modules can easily perform the tasks outlined and, as indicated, we suggest thumb wheel switches to set up the ten potential programs and a simple two digit type display to indicate program status with another two digit display to indicate repeat status on any step.

We have not evaluated in any way the cost of the I/O or Operator Interface hardware. However, for your information, the STC modules on the basis of ten units would be $300.00 each with modules available for first delivery in August of this year.

At the present time, we are completing an Operator's Handbook which will include application notes for all the conventional I/O hardware; motors, switches, displays, etc., and will also include greater details of the software and its implementation. This handbook will be available approximately mid-June and I will forward a copy at that time.

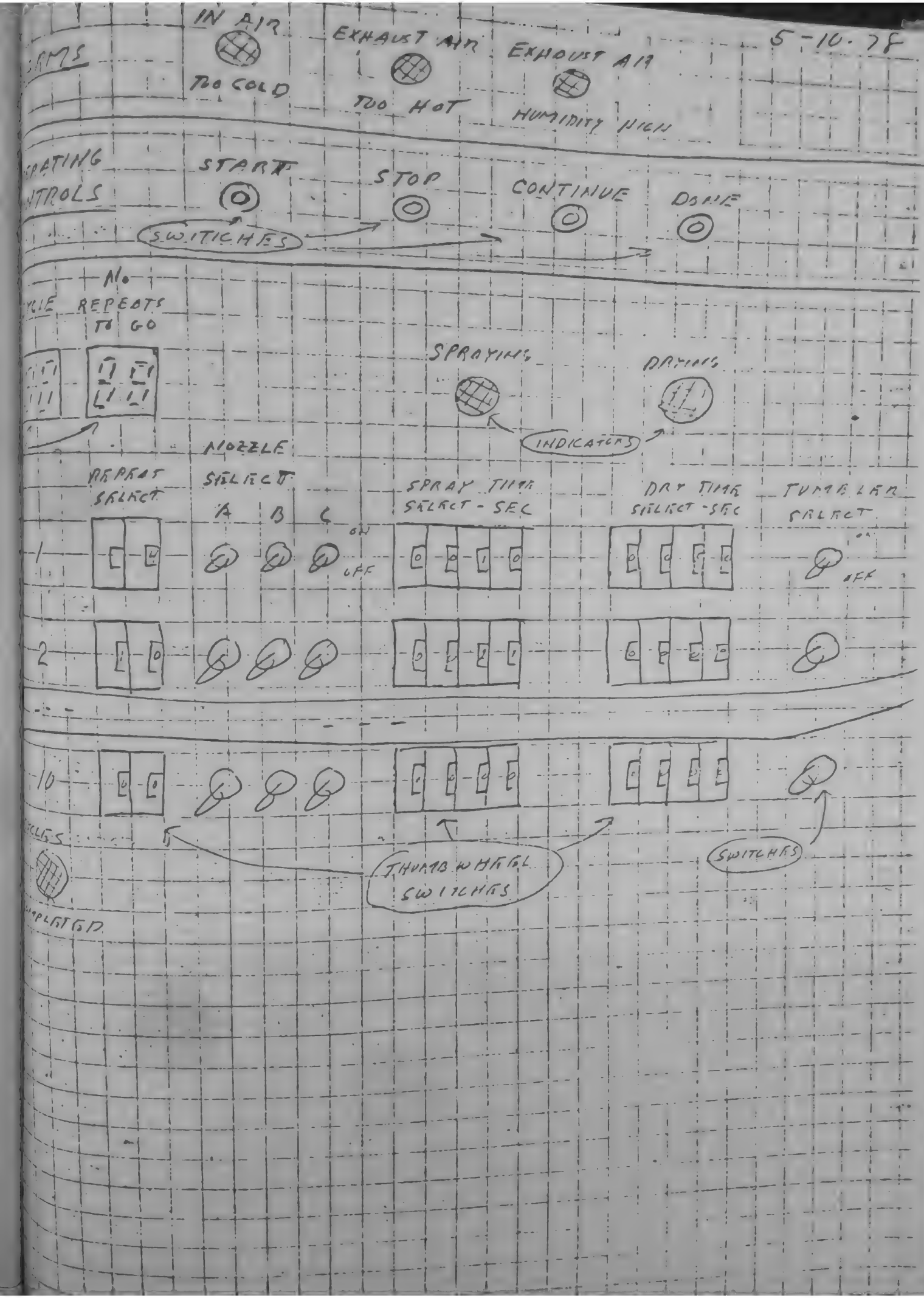
I hope the attached data answers most of your questions and if not, please do not hesitate to contact us if you need additional information.

Yours very truly,

R. Browning
Marketing Manager
Subsystems

/bl

enclosures a/s

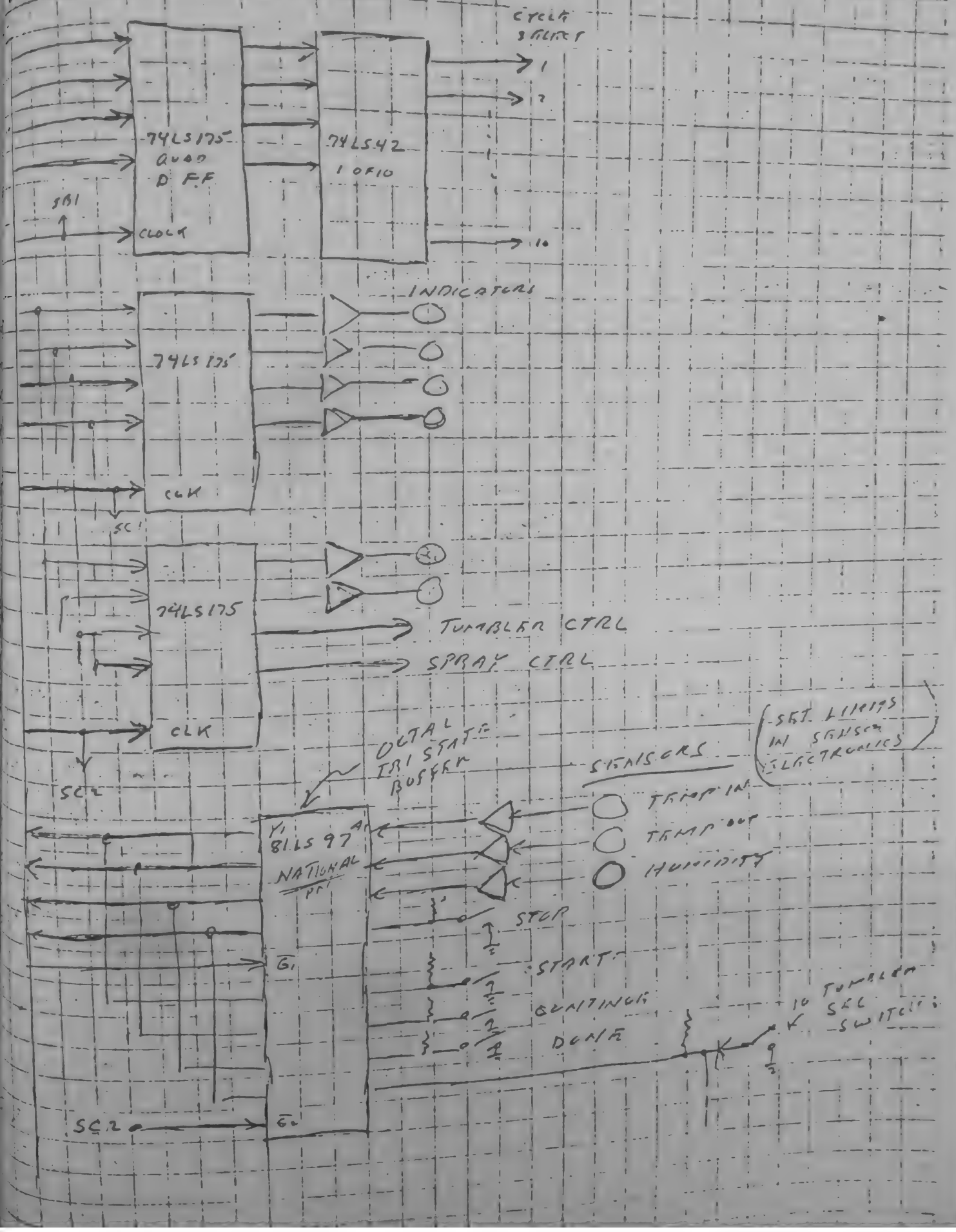

5-10-78
IN AIR
TOO COLD
EXHAUST AIR
TOO HOT
EXHAUST AIR
HUMIDITY HIGH
START
STOP
CONTINUE
DONE
SWITCHES
No. REPEATS TO GO
SPRAYING
DRYING
INDICATORS
NOZZLE SELECT
A B C
REPEAT SELECT
SPRAY TIME SELECT - SEC
DRY TIME SELECT - SEC
TUMBLER SELECT
ON
OFF
1
2
10
THUMB WHEEL SWITCHES
SWITCHES

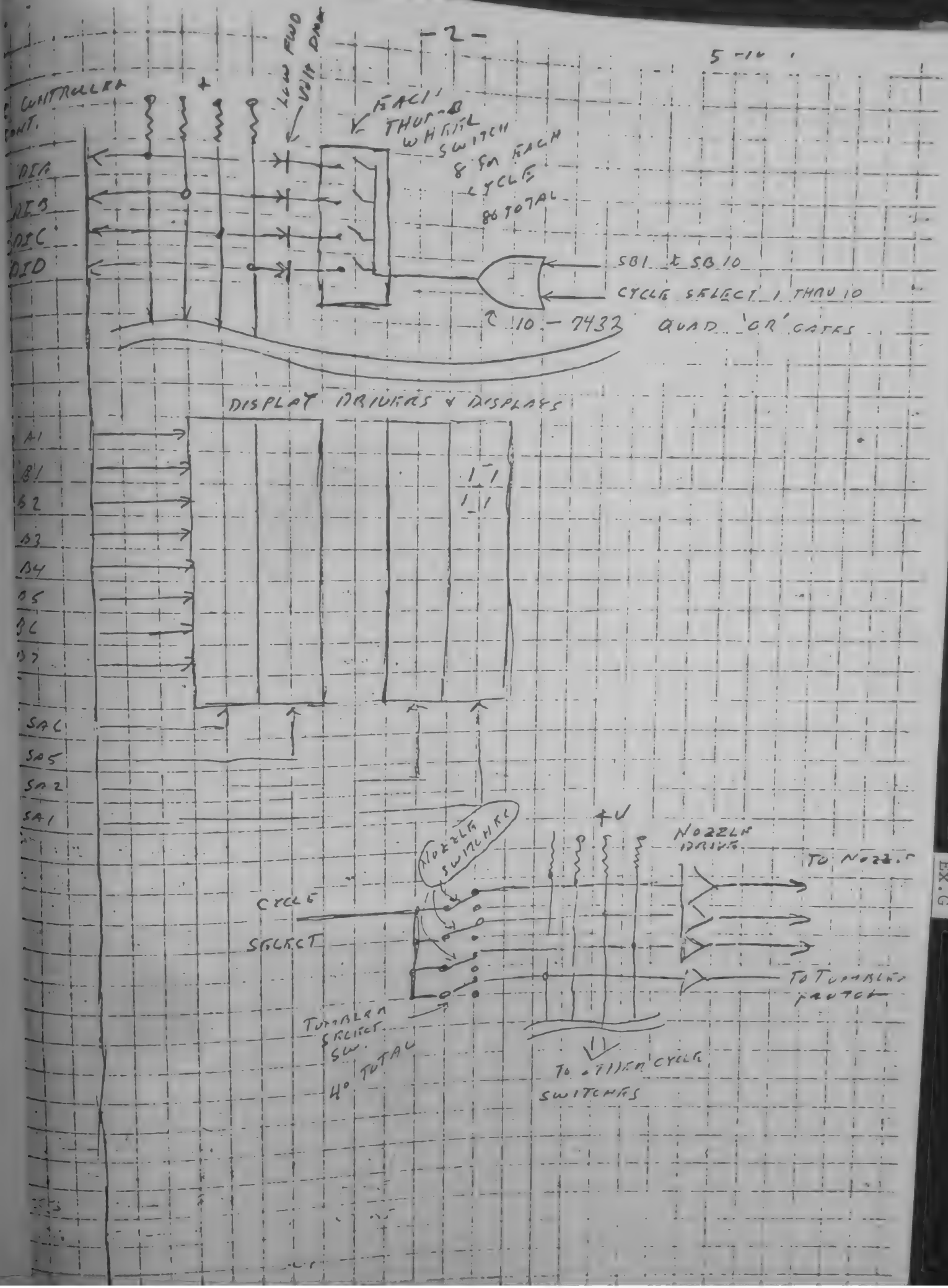
Ex. G

POSSIBLE MECHANIZATION

5-10-78

CONTROLLER




CONTROLLER CONT.
DIA
DIB
DIC
DID
+
LOW FWD
VOLTAGE
EACH THUMB WHEEL SWITCH 8 FOR EACH CYCLE 80 TOTAL
SB1 & SB10
CYCLE SELECT 1 THRU 10
10 - 7433 QUAD 'OR' GATES
DISPLAY DRIVERS & DISPLAYS
A1
B1
B2
B3
B4
D5
D6
D7
SA6
SA5
SA2
SA1
NOZZLE SWITCHES
+V
NOZZLE DRIVE
TO NOZZLES
CYCLE
SELECT
TO TUMBLER PATTERN
TUMBLER SELECT SW.
40 TOTAL
TO 'TIMER' CYCLE SWITCHES

Ex. G

```
;DEFINE I/O'S
; 5/11/78
;
STARTSN = BIS1 START
  SWITCH
CONTSN = BIS2
  CONTINUE SWITCH
DONE = BIS3 DONE
  SWITCH
TUMBSW = BIS4
  TUMBLER SELECT
  SWITCH
CYCLEC = DO0 CYCLE
  SELECT OUTPUT
;
;INDICATORS OUT
;
INTEMP = BOS1 INPUT
  AIR TOO COLD
OUTEMP = BOS2
  EXHAUST AIR TOO
  HOT
OUTHUMID = BOS3
  EXHAUST AIR
  HUMIDITY TOO HIGH
CYCLCMP = BOS4 CYCLE
  COMPLETE
SPRAY1 = BOS5
  SPRAYING LAMP
DRY1 = BOS6 DRYING
  LAMP
;
;CONTROLS OUT
;
TUMBLER = BOS7
  TUMBLER PAN MOTOR
SPRAY = BOS8 SPRAY
  NOZZLE CONTROL
;
;THUMB WHEEL SW
  INPUTS
SPRAYT = DI1 SPRAY
  TIME
DRYT = DI2 DRY TIME
REPEAT = DI3 NO.
  TIMES TO REPEAT
;
;COUNTERS
;
NOREP = CNTR17
  WORKING COUNTER
  FOR NO TIMES TO
  REPEAT
CYCLE = CNTR18
  COUNTER FOR CYCLE
  NUMBER
;
;TIMER
;
TIME = TIM1 WORKING
  TIMER
;
;DISPLAYS
;
DISPR =DSPL1 NUMBER
  OF REPEATS TO GO
DISPC = DSPL2
  CURRENT CYCLE
  NUMBER
```

```
R =DSPL1 NUMBER
 REPEATS TO GO
C = DSPL2
URRENT CYCLE
UMBER

R = FLAG1
B = FLAG2

LF = VFLG VECTOR
ABLE
ART OF COMMANDS
RY0
N ENABLE ON
N TUMBLER OFF
N SPRAYC OFF
N INTEMP OFF
N OUTTEMP OFF
N OUTHUMID OFF
N CYCLCNF OFF
N SPRAY1 OFF
N DRY1 OFF
 DISPR = 0
 DISPC = 0

T STARTSW ON
 CYCLE = 0
RY1

 1 TO CYCLE
 DISPC = CYCLE
 SET DISPLAY FOR
 CYCLE NUMBER
 CYCLEC = CYCLE
 SET THE CYCLE
 COUNTER UP
 REPEAT = 0 GO TO
 ENTRY3
 NOREP = REPEAT
 SET THE REPEAT
 COUNTER TO THE
 SWITCH INPUTS
 DISPR = REPEAT
 SET UP THE REPEAT
 DISPLAY

NTRY2

T TIME = SPRAYT
UBTRACT 1 FROM
 DISPR DECREASES
 THE NUMBER OF
 REPEATS TO GO BY
 ONE
N DRY1 OFF
N TUMBLER ON
N SPRAYC ON
N SPRAY1 ON TURN
 INDICATOR LAMP ON
 FOR SPRAY

IT UNTIL TIME IS
 OFF

N SPRAYC OFF

N SPRAY1 OFF
N DRY1 ON TURN
 INDICATOR ON FOR
```

```
SPRAY OFF

URN SPRAY1 OFF
URN DRY1 OR TURN
INDICATOR ON FOR
DRY CYCLE
ET TIME = DRY1

AIT UNTIL TIME IS
 OFF
UBTRACT 1 FROM
 NUMREP
F NUMREP > 0
O TO ENTRY2
O TO ENTRY1

NTRY3

URN DRY1 OFF
URN SPRAY1 OFF
URN CYCLCMP ON

NTRY4

URN TUMBLER ON
ET TIMER = 10 SEC

NTRY5

F DONESW ON
O TO ENTRY6

F TIMER ON
O TO ENTRY5

ET TIMER = 60 SEC
URN TUMBLER OFF

NTRY6

F DONESW ON
O TO ENTRY6
F TIMER ON
O TO ENTRY6
O TO ENTRY4

STOPSW/VECT4 STOP
 SWITCH INPUT

O TO ENTRYS1

TEMPIN/VECT1 INLET
 AIR TEMP SENSOR

URN INTEMP ON
O TO ENTRYS1

TEMPOUT/VECT2
 EXHAUST TEMP
 SENSOR

URN TEMPOUT ON

ENTRYS1

URN FLAG6 OFF
URN FLAG8 OFF

 SPRAYC ON
 FLAG6 ON
 TUMBLER ON
 FLAG8 ON
```

```
SENSUP
TURN TEMPOUT ON
;
ENTRYS1
;
TURN FLAGA OFF
TURN FLAGB OFF
;
IF SPRAYC ON
TURN FLAGA ON
IF TUMBLER ON
TURN FLAGB ON
TURN SPRAYC OFF
TURN TUMBLER OFF
;
ENTRYA2
;
IF DONESN ON
GO TO ENTRYB
IF CONTSN OFF
GO TO ENTRYA2
;
IF FLAGA ON
TURNSPRAYC ON
IF FLAGB ON
TURN TUMBLER ON
TURN INTEMP OFF
TURN OUTTEMP OFF
TURN OUTHUMID OFF
RETURN
;
HUMIDITY/VENT3
  EXHAUST AIR
  HUMIDITY SENSOR
;
TURN OUTHUMID ON
GO TO ENTRYS1
;
;END
```

QUARTERMAN LEE
PROFESSIONAL ENGINEER
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KANSAS CITY, MISSOURI 64105
816-471-7682

#161

May 30, 1979

Rockwell International
Micro-Electronic Devices
Sub-Systems Application Engineering, D/833-051BC33
PO Box 3669
Anaheim, California 92803

Gentlemen:

As Consulting Engineer for American Dish Service of Kansas City, Missouri I am in the process of designing a new model for their line of commercial dish washers. We would like to investigate the possibility of using electronic control and your STC Universal Controller Module appears to be appropriate for this machine. I have enclosed an electrical diagram and a sequence diagram and would appreciate it if you would look this over and get back to me.

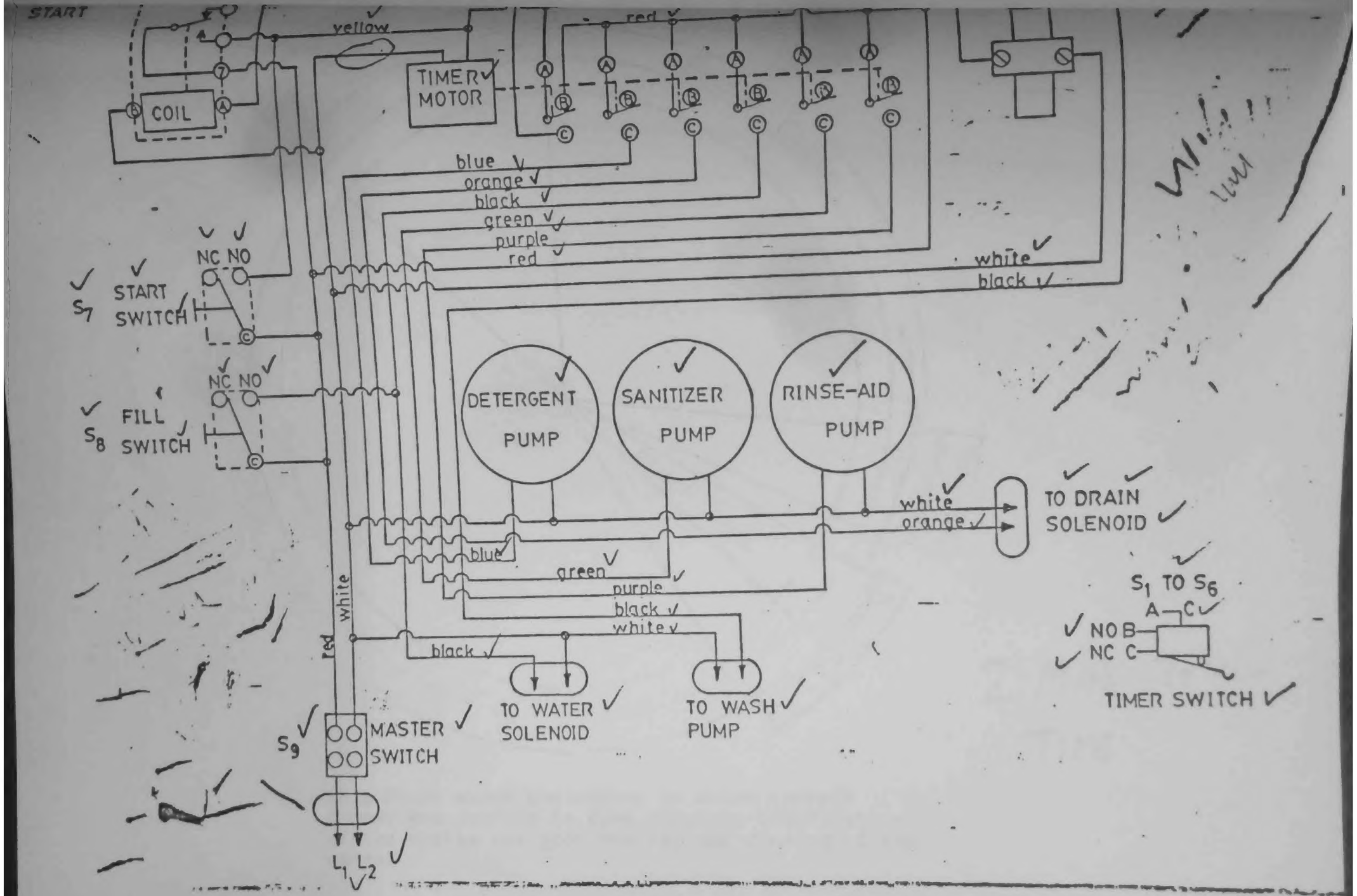
We anticipate initial production of about 2,000 units per year, eventually going up to 4,000 to 5,000 units.

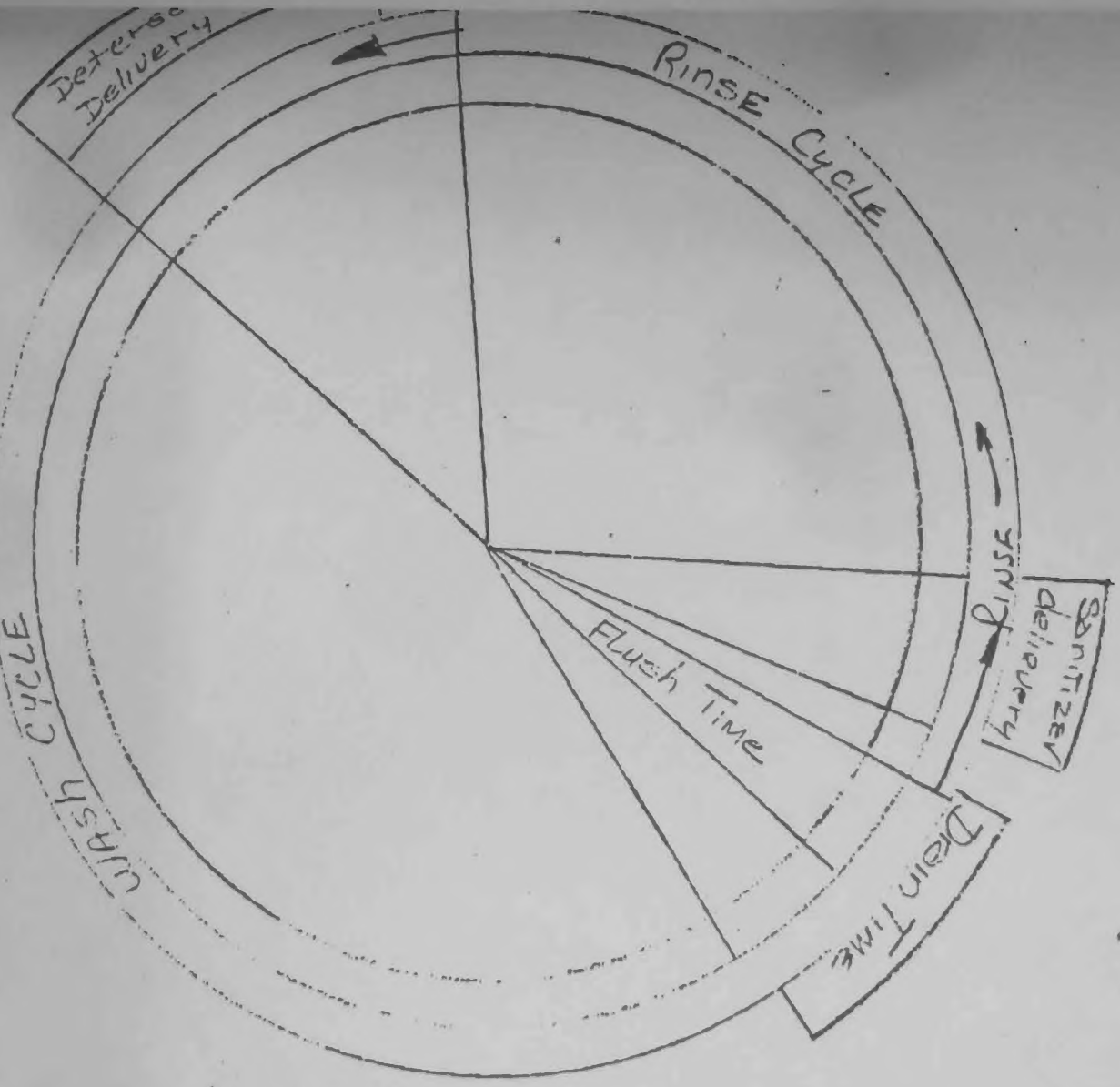
Thank you for your assistance and I look forward to your prompt reply.

Sincerely,

Quarterman Lee

Enc.
gh


START
yellow
red
TIMER MOTOR
COIL
blue
orange
black
green
purple
red
white
black
NC NO
START SWITCH
S_7
NC NO
FILL SWITCH
S_8
DETERGENT PUMP
SANITIZER PUMP
RINSE-AID PUMP
white
orange
TO DRAIN SOLENOID
blue
green
purple
black
white
black
red
white
TO WATER SOLENOID
TO WASH PUMP
S_1 TO S_6
A C
NO B
NC C
TIMER SWITCH
S_9
MASTER SWITCH
L_1 L_2



2 MIN TOTAL TIME

This Chart shows the manner in which certain operations overlap to give complete coordination of the cycles and good washing and rinsing of the wares.